



PHYSICS NMDCAT

TOPIC WISE TEST (UNIT-10)

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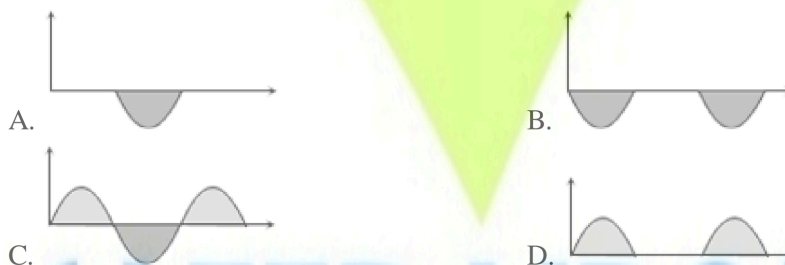
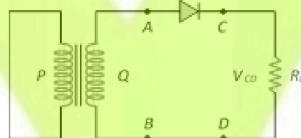
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TOPICS:

✓ **Electronics**

✓ **Dawn of Modern Physics**

- Q. 1** A particle which has zero rest mass and non-zero energy and momentum must travel with a speed
- A. Equal to c , the speed of light in vacuum B. Greater than c
C. Less than c D. Tending to infinity
- Q. 2** Dual nature of radiation is shown by
- A. Diffraction and reflection B. Refraction and diffraction
C. Photoelectric effect alone D. Photoelectric effect and diffraction
- Q. 3** In the half-wave rectifier circuit shown. Which one of the following wave forms is true for V_{CD} , the output across C and D?



- Q. 4** Output of half wave rectifier is suitable only
- A. To operate radio B. For running a D.C motor
C. Charging batteries D. All of these
- Q. 5** To reduce ripples in the output of bridge rectifier we should use
- A. Diodes having low forward resistance B. Low frequency A.C
C. Diodes having high forward resistance D. A filter circuit
- Q. 6** AC voltage is fed into a single diode rectifier. The output of the rectifier is
- A. Full wave rectified dc voltage B. Double frequency AC voltage
C. Half wave rectified dc voltage D. None of these
- Q. 7** In forward biases, the height of potential barrier:
- A. Increases B. Decreases
C. Remain same D. None
- Q. 8** A photon in motion has a mass
- A. $\frac{c}{hf}$ B. $\frac{h}{f}$
C. hf D. $\frac{hf}{c^2}$
- Q. 9** There are n_1 photons of frequency f_1 in beam of light. In an equally energetic beam, there are n_2 photons of frequency f_2 then the correct relation is



A. $\frac{n_1}{n_2} = 1$

C. $\frac{n_1}{n_2} = \frac{f_1}{f_2}$

B. $\frac{n_1}{n_2} = \frac{f_2}{f_1}$

D. $\frac{n_1}{n_2} = \frac{f_1^2}{f_2^2}$



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- Q. 10 A material particle with a rest mass m_0 is moving with speed of light c . The associated de-Broglie wavelength is given by
- A. $\frac{h}{m_0 c}$ B. $\frac{m_0 c}{h}$
C. 0 D. ∞
- Q. 11 The energy of a photon of wavelength λ is
- A. $hc\lambda$ B. λ/hc
C. hc/λ D. $h\lambda/c$
- Q. 12 If E_1, E_2, E_3 are the respective kinetic energies of an electron, an alpha-particle and a proton, each having the same de-Broglie wavelength then
- A. $E_1 > E_3 > E_2$ B. $E_2 > E_3 > E_1$
C. $E_1 > E_2 > E_3$ D. $E_1 = E_2 = E_3$
- Q. 13 What will be the ratio of de-Broglie wavelengths of proton and alpha particle of same energy
- A. 2 : 1 B. 4 : 1
C. 1 : 2 D. 1 : 4
- Q. 14 de-Broglie hypothesis treated electrons as
- A. Particles B. Waves
C. Both A and B D. None of these
- Q. 15 The momentum of photon is $3.3 \times 10^{-29} \text{ kgms}^{-1}$. Its frequency will be
- A. $3 \times 10^3 \text{ Hz}$ B. $7.5 \times 10^3 \text{ Hz}$
C. $6 \times 10^3 \text{ Hz}$ D. $1.5 \times 10^{13} \text{ Hz}$
- Q. 16 The momentum of photon of wavelength 5000 \AA will be
- A. $1.3 \times 10^{-27} \text{ kgms}^{-1}$ B. $4 \times 10^{29} \text{ kgms}^{-1}$
C. $1.3 \times 10^{-28} \text{ kgms}^{-1}$ D. $4 \times 10^{-18} \text{ kgms}^{-1}$
- Q. 17 De Broglie wave length associated with an electron at a speed of $1 \times 10^6 \text{ ms}^{-1}$
- A. $7 \times 10^{-10} \text{ m}$ B. $5 \times 10^{-10} \text{ m}$
C. $6 \times 10^{-10} \text{ m}$ D. $4 \times 10^{-10} \text{ m}$
- Q. 18 According to De-Broglie, an electron can be regarded as:
- A. Particle only B. Are negligible
C. Particle and wave both D. None of these
- Q. 19 De-Broglie's hypothesis of wave nature of electrons was confirmed experimentally by:
- A. Lummer and Pringsheim B. Davissan and Germer
C. Einstein and Max Planks D. Photoelectric equation
- Q. 20 The wavelength of electrons is _____ times shorter than those of visible light used in optical microscope
- A. 10 B. 100
C. 1000 D. 10000
- Q. 21 The specimen being observed by electron microscope must be very thin to minimize _____ of electrons
- A. Interference B. Polarization
C. Scattering D. All of these
- Q. 22 A three-dimensional image of remarkable quality can be achieved by modern versions called
- A. Scanning electron microscope B. Scanning proton microscope
C. Scanning electron telescope D. Scanning electron spectrometer
- Q. 23 In order to reduce the uncertainty in momentum, light of _____ wavelength is used
- A. Smaller B. Larger
C. Intermediate D. Infinite



Q. 24 The uncertainty in the position and momentum can be written as:

A. $\Delta x. \Delta p \approx h$

B. $\Delta x. \frac{1}{\Delta p} \approx h$

C. $\Delta p. \frac{1}{\Delta X} \approx h$

D. $\Delta x. \Delta p \frac{1}{\Delta h}$

Q. 25 The form of uncertainty principle which relates the energy of a particle and the time at which it had the energy is given by:

A. $\Delta E.h \approx \Delta t$

B. $\Delta E. \Delta t \approx 2h$

C. $\Delta E. \Delta P \approx h$

D. $\Delta E. \Delta t \approx h$

Q. 26 Uncertainty in position of electron will be minimum for light of _____

A. Larger wavelength

B. Smaller wavelength

C. Intermediate wavelength

D. Infinite wavelength

Q. 27 The application of wave like nature of particle is

A. C.R.O

B. Photo diode

C. Simple microscope

D. Electron Microscope

Q. 28 The de-Broglie wavelength of a neutron when its kinetic energy is K is λ . What will be its wavelength when its kinetic energy is 4K?

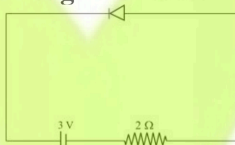
A. $\frac{\lambda}{4}$

B. $\frac{\lambda}{2}$

C. 2λ

D. 4λ

Q. 29 In the given figure the current through the resistor is practically.



A. 5 A

B. 2 A

C. Zero

D. 1 A

Q. 30 De-Broglie waves are associated with

A. Moving charged particles only

B. Moving neutral particles only

C. All moving particles

D. All particles whether in motion or at rest

Q. 31 De-Broglie wavelength of a 0.20kg ball moving with a speed of 15ms^{-1} is

A. $2.2 \times 10^{-34}\text{m}$

B. $0.4 \times 10^{-30}\text{m}$

C. $1 \times 10^{-32}\text{m}$

D. $3 \times 10^{-5}\text{m}$

Q. 32 Conversion of A.C into D.C. is called

A. Modulation

B. Amplification

C. Oscillation

D. Rectification

Q. 33 For rectification we use

A. Transformer

B. Diode

C. Choke

D. Generator

Q. 34 In bridge rectifier, number of diodes required are equal to;

A. 1

B. 2

C. 3

D. 4

Q. 35 What is the de Broglie wavelength of a proton whose linear momentum has a magnitude of $3.3 \times 10^{-23} \text{ kg} \cdot \text{m/s}$?

A. 0.0002 nm

B. 0.002 nm

C. 0.02 nm

D. 0.2 nm

Q. 36 Which one of the following radiations has the strongest photon?

A. T.V waves

B. Micro waves

C. X-rays

D. γ -rays

Q. 37 The electron, accelerated by a potential difference V has de-Broglie wavelength λ . If the electron is accelerated by a p.d 4V, its de-Broglie wavelength will be

A. 2λ

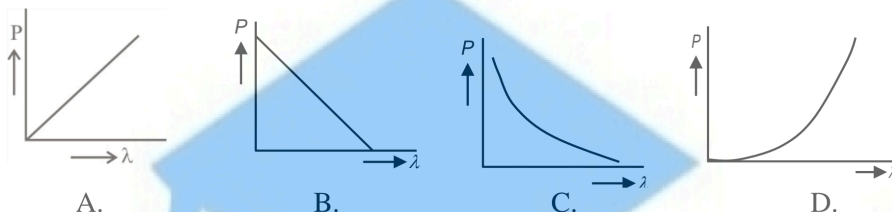
B. 4λ

C. $\frac{\lambda}{2}$

D. $\frac{\lambda}{4}$



- Q. 38 Which of the following graphs represent the variation of particle momentum and the associated de-Broglie wavelength?



- Q. 39 The velocity of a particle of mass m of de-Broglie wavelength λ is _____
- A. $\frac{2h}{m\lambda}$ B. $\frac{m\lambda c^2}{h}$
C. $2m\lambda c^2$ D. $h/m\lambda$
- Q. 40 Ratio of momentum of photons having wavelength 4000 angstrom and 8000 angstroms is
- A. 2 : 1 B. 1 : 2
C. 20 : 1 D. 1 : 20
- Q. 41 A 1 kg mass moving at a velocity of 6.63 m/sec will have a de-Broglie wavelength
- A. 6.63×10^{-34} m B. 10^{-34} m
C. 6.63 m D. None of the above
- Q. 42 If the de-Broglie wavelengths for a proton and for a α -particle are equal, then the ratio of their velocities will be
- A. 1:2 B. 1:4
C. 2:1 D. 4 : 1
- Q. 43 If an electron and a photon propagate in the form of waves having the same wavelength, it implies that they have the same
- A. Velocity B. Energy
C. Angular momentum D. Momentum
- Q. 44 The kinetic energy of electron and proton is 10^{-32} J. Then the relation between their de-Broglie wavelengths is
- A. $\lambda_p = \lambda_e$ B. $\lambda_p > \lambda_e$
C. $\lambda_p < \lambda_e$ D. $\lambda_p = 2\lambda_e$
- Q. 45 The wavelength of the matter wave is independent of
- A. Charge B. Mass
C. Velocity D. Momentum.
- Q. 46 The momentum of a photon is 2×10^{-16} gm-cm/sec. Its energy is
- A. 6×10^{-8} erg B. 6×10^{-6} erg
C. 2.0×10^{-26} erg D. 0.61×10^{-26} erg
- Q. 47 An electron is at rest. Its wavelength is
- A. 1 B. It has not wave character
C. hc/m D. $hc \times m_0$
- Q. 48 The magnitude of de-Broglie wavelength (λ) of electrons (e) proton (p) neutron n and α particles, all have the same energy 1 MeV, in increasing order will follow the sequence.
- A. $\lambda_e, \lambda_p, \lambda_n, \lambda_\alpha$ B. $\lambda_e, \lambda_\alpha, \lambda_n, \lambda_p$
C. $\lambda_\alpha, \lambda_n, \lambda_p, \lambda_e$ D. $\lambda_\alpha, \lambda_p, \lambda_n, \lambda_e$
- Q. 49 To decrease uncertainty in the measurement of position and momentum of a particle
- | | Position | Momentum |
|----|--------------------|--------------------|
| A. | Decrease λ | Increase λ |
| B. | Increase λ | Decrease λ |
| C. | Decrease λ | Decrease λ |
| D. | Increase λ | Increase λ |
- Q. 50 The de-Broglie wavelength of a particle accelerated with 150-volt potential is 10^{-10} m. If it is accelerated by 600 volts p.d., its wavelength will be
- A. 0.25 Å B. 0.5 Å
C. 1.5 Å D. 2 Å



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Phy T-10

(Physics unit #10)

Date: _____

- | | | | | |
|-------|------------------------------------|-------|-------|-------|
| 01- a | 11- c | 21- c | 31- a | 41- b |
| 02- d | 12- a | 22- a | 32- d | 42- d |
| 03- d | 13- a | 23- b | 33- b | 43- d |
| 04- c | 14- b | 24- a | 34- d | 44- c |
| 05- d | 15- d ($f = \frac{pc}{h}$) | 25- d | 35- c | 45- a |
| 06- c | 16- a | 26- b | 36- d | 46- b |
| 07- b | 17- a ($\lambda = \frac{h}{mv}$) | 27- d | 37- c | 47- b |
| 08- d | 18- c | 28- b | 38- c | 48- c |
| 09- b | 19- b | 29- c | 39- d | 49- a |
| 10- c | 20- c | 30- c | 40- a | 50- b |

Answer
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